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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
DOLE, TIMOTHY J	
ART UNIT	**PAPER NUMBER**
2858	

DATE MAILED: 04/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/058,191	BURDICK ET AL.	
	Examiner	Art Unit	
	Timothy J. Dole	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *31-59,61 and 62* is/are allowed.

6)☒ Claim(s) *1-3,11-14,20,21,23-30 and 60* is/are rejected.

7)☒ Claim(s) *4-10,15-19 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 11-14, 20, 21, 23, 24 and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto et al. in view of Bronowocki et al.

Referring to claim 1, Pinto et al. discloses a capacitive sensor for measuring a stimulus parameter, the sensor comprising: a circuit board (fig. 6 (214)) including at least one metallic layer (fig. 6 (216)); a metallic diaphragm (fig. 6 (202)) coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor characterized by a capacitance, the metallic diaphragm being adapted to move relative to the at least one metallic layer in response to a change in the stimulus parameter (column 1, lines 47-50), whereby the capacitance changes in accordance with the change in the stimulus parameter (column 2, lines 15-21); and an oscillator circuit (fig. 5 (136)), whereby the frequency changes in accordance with capacitance changes (column 2, lines 15-21). It should be noted that reference numeral 214 includes capacitor plate 216, insulator 218, and inductor coil 220 and is in the same form as fig. 1 (column 7, lines 8-12). Also, Pinto et al. discloses that the elements of fig. 1 may be constructed using

printed circuit board techniques (column 5, lines 4-8). Therefore, reference element 214 could also be referred to as a circuit board.

Pinto et al. does not disclose the oscillator circuit includes a low pass filter.

Bronowocki et al. discloses a pressure sensor with an oscillator (fig. 8 (240)), including a low-pass filter (fig. 8 (228)) coupled to the transducer capacitor (fig. 8 (200)), the oscillator circuit being configured to generate a filtered signal characterized by a frequency.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the purpose of attenuating signals outside the filter range whereby leading to more accurate data (column 10, lines 6-10).

Referring to claim 2, Pinto et al. discloses the sensor as claimed wherein the metallic diaphragm becomes substantially curved in response to the stimulus parameter (column 4, lines 17-22).

Referring to claim 11, Pinto et al. discloses the sensor as claimed except wherein the low-pass filter includes an impedance element coupled to a first shunt capacitor.

Bronowocki et al. discloses the low-pass filter includes an impedance element (fig. 1 (112)) coupled to a first shunt capacitor (fig. 1 (114)).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the same purpose as given in claim 1, above.

Referring to claim 12, Pinto et al. discloses the sensor as claimed except wherein the impedance element includes a resistor, or an inductor, or both.

Bronowocki et al. discloses the impedance element includes a resistor (fig. 1 (112)), or an inductor, or both.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the same purpose as given in claim 1, above.

Referring to claim 13, Pinto et al. discloses the sensor as claimed except wherein the first shunt capacitor is coupled to AC ground.

Bronowocki et al. discloses the first shunt capacitor is coupled to AC ground (fig. 1).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the same purpose as given in claim 1, above.

Referring to claim 14, Pinto et al. discloses the sensor as claimed except wherein the low-pass filter is connected to the input of the transducer capacitor.

Bronowocki et al. discloses the low-pass filter is connected to the input of the transducer capacitor (fig. 8 (214a)).

Referring to claim 20, Pinto et al. discloses the sensor as claimed wherein the metallic diaphragm (fig. 6 (202)) does not include an attached metallic plate.

Referring to claim 21, Pinto et al. discloses a capacitive sensor for measuring a stimulus parameter, the sensor comprising: a capacitor transducer (fig. 6) including at

least one fixed plate member (fig. 6 (216)), the capacitor transducer being characterized by a variable capacitance, whereby the variable capacitance varies in accordance with a change in the stimulus parameter (column 2, lines 15-21); and an oscillator circuit (fig. 5 (136)) coupled to the capacitor transducer, (fig. 5 (132)) coupled to an input of the capacitive transducer, having a frequency, whereby the frequency is proportional to the stimulus parameter (column 2, lines 15-21).

Pinto et al. does not disclose an oscillator circuit including a low-pass filter, the oscillator circuit generating a non-sinusoidal signal.

Bronowocki et al. discloses a pressure sensor with an oscillator (fig. 8 (240)), coupled to the capacitor transducer (fig. 8 (200)), the oscillator circuit including a low-pass filter (fig. 8 (228)) coupled to an input of the capacitor transducer (fig. 8 (200)), the oscillator circuit generating a non-sinusoidal signal having a frequency (column 6, lines 25-53), whereby the frequency is proportional to the stimulus parameter (abstract).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the oscillator of Bronowocki et al. into the sensor of Pinto et al. for the same purpose as given in claim 1, above.

Referring to claims 23 and 27-30, Pinto et al. discloses the sensor as claimed wherein the stimulus parameter is fluid pressure, pressure, force, displacement or humidity (column 4, lines 12-16). It should be noted that the sensor of Pinto et al. could measure the stimulus parameters listed above since all the parameters would cause a change in the capacitance of the sensor.

Referring to claim 24, Pinto et al. discloses the sensor as claimed, further comprising: a circuit board (fig. 6 (214)) including at least one metallic layer (fig. 6 (216)); and a metallic diaphragm (fig. 6 (202)) coupled to the circuit board and juxtaposed to the metallic layer to thereby form the variable capacitor transducer, the metallic diaphragm being adapted to move relative to the at least one metallic layer in response to a change in the fluid pressure (column 1, lines 47-50), whereby the variable capacitance changes in accordance with the change in the fluid pressure (column 4, lines 12-16).

Referring to claim 26, Pinto et al. discloses the sensor as claimed except wherein the low-pass filter includes a shunt capacitor (fig. 4A (130)) and a resistor (fig. 4A (120)).

Bronowocki et al. discloses the low-pass filter includes a shunt capacitor (fig. 1 (114)) and a resistor (fig. 1 (112)).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the low pass filter of Bronowocki et al. into the oscillator in the sensor of Pinto et al. for the same purpose as given in claim 1, above.

3. Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto et al. in view of Pechoux et al.

Referring to claim 60, Pinto et al. discloses a capacitive sensor for measuring a stimulus parameter, the sensor comprising: a circuit board (fig. 6 (214)) including at least one metallic layer (fig. 6 (216)); a metallic diaphragm (fig. 6 (202)) coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor characterized by a capacitance, the metallic diaphragm being adapted to move relative to

the at least one metallic layer in response to a change in the stimulus parameter (column 1, lines 47-50) such that the capacitance changes in accordance with stimulus parameter changes (column 2, lines 15-21); a pressure port assembly (fig. 6 (210b)), whereby a cavity (fig. 6 (204)) is formed between a pressure port and the metallic diaphragm; and an oscillator circuit (fig. 5 (136)) coupled to the transducer capacitor, the oscillator circuit being configured to generate a signal characterized by a frequency that changes in accordance with capacitance changes (column 2, lines 15-21).

Pinto et al. does not disclose a conductive ring disposed between the metallic diaphragm and the circuit board.

Pechoux et al. discloses a conductive ring (fig. 2 (8)) disposed between the metallic diaphragm (fig. 2 (7)) and the circuit board (fig. 2 (13a)) and a pressure port (fig. 2 (9)) assembly coupled to the conductive ring, whereby a cavity (fig. 2 (5a)) is formed between a pressure port and the metallic diaphragm.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the conductive ring of Pechoux et al. into the sensor of Pinto et al. for the purpose of ensuring electrical connections are made between the circuit and the diaphragm whereby leading to results that are more consistent and accurate (column 4, lines 34-37).

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto et al. in view of Bronowocki et al. as applied to claim 1 above, and further in view of Pechoux et al.

Referring to claim 3, Pinto et al. as modified discloses the sensor as claimed, further comprising a pressure port assembly (fig. 6 (210b)), whereby a cavity (fig. 6 (204)) is formed between a pressure port and the metallic diaphragm.

Pinto et al. as modified does not disclose a conductive ring disposed between the metallic diaphragm and the circuit board.

Pechoux et al. discloses a conductive ring (fig. 2 (8)) disposed between the metallic diaphragm (fig. 2 (7)) and the circuit board (fig. 2 (13a)) and a pressure port (fig. 2 (9)) assembly coupled to the conductive ring, whereby a cavity (fig. 2 (5a)) is formed between a pressure port and the metallic diaphragm.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the conductive ring of Pechoux et al. into the sensor of Pinto et al. as modified for the purpose of ensuring electrical connections are made between the circuit and the diaphragm whereby leading to results that are more consistent and accurate (column 4, lines 34-37).

5. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto et al. in view of Bronowocki et al. as applied to claims 21, 23 and 24 above, and further in view of Wallrafen.

Referring to claim 25, Pinto et al. as modified discloses the sensor as claimed except wherein a second capacitor forms a capacitance divider with an inter-plate capacitance generated between the metallic diaphragm and the metallic layer.

Wallrafen discloses a second capacitor (fig. 2 (7)) forms a capacitance divider with an inter-plate capacitance generated between the metallic diaphragm and the metallic layer (column 1, lines 34-38).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second capacitor of Wallrafen into the sensor of Pinto et al. for the purpose of inexpensively and reliably evaluating a signal from a capacitive sensor (column 1, lines 29-33).

Response to Arguments

6. Applicant's arguments filed January 13, 2004 have been fully considered but they are not persuasive.

7. In response to the Applicants arguments with respect to the independent claims, that "Pinto does not disclose a circuit board" (page 3, line 7), it should be noted that Merriam Webster's Collegiate Dictionary, tenth edition, defines a circuit board as a sheet of insulating material carrying circuit elements. Therefore even though Pinto refers to reference numeral 214 as an electrode assembly, it clearly fits the definition of a circuit board, since it contains a sheet of insulating material, 218, and circuit elements, such as inductor coil 220.

8. In response to the Applicants arguments with respect to the independent claims, that "Pinto does not disclose a metallic diaphragm coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor" (page 3, lines 17-18), it should be noted that as started in the previous office action, the metallic diaphragm is shown by reference

numeral 202, which, along with the metallic layer, 216, forms a transducer capacitor, 230 (column 7, lines 8-37).

9. In response to the Applicants arguments with respect to claims 1 and 21, that "neither Pinto nor Bronowocki disclose an oscillator that includes a low pass filter" (page 6, lines 1-2), it should be noted that as stated in the rejection above, that all the elements of the claim are accounted and shown in the combination of Pinto and Bronowocki. First, Applicants argue that reference numeral 200 is not a capacitor, when it clearly is, as shown in figure 8, and described by Bronowocki as capacitive piezoelectric transducer (column 9, lines 5-7). Second, Applicants argue that reference numeral 240 is not an oscillator, when it clearly is, since Bronowocki refers to numeral 240 as an oscillator circuit which includes low pass filter 228 (column 11, lines 10-14). Finally, Applicants argue that the LP filter 228 is not applicable to the claimed invention because its function is to attenuate vibrational frequencies outside a desired range of vibrational frequencies, and cites column 10, lines 6-10 of Bronowocki. It should be emphasized that "apparatus claims must be structurally distinguishable from the prior art." MPEP 2114. In *In re Danly*, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959) it was held that apparatus claims must be distinguished from prior art in terms of **structure** rather than **function**. In *Hewlett-Packard Co v Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990), the court held that: "Apparatus claims cover what a device **is**, not what it **does**." (emphases in original). To emphasize the point further, the court added: "An invention need not **operate** differently than the prior art to be patentable, but need only **be** different" (emphases in original). That is, in an apparatus claim, if a prior art structure discloses all of the **structural elements** in the claim, as well as their relative juxtaposition, then it **reads** on the claim,

regardless of whether or not the **function** for which the prior art structure was intended is the same as that of the claimed invention.

10. In response to Applicants argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, motivation is found in Bronowocki, as stated in the rejection above, for the purpose of leading to more accurate data by attenuating frequencies outside a certain range.

11. In response to the Applicants arguments, that "neither Pinto nor Pechoux disclose a conductive ring or the pressure port assembly as recited in claim 60" (page 7, lines 18-19), it should be noted that, Pechoux does discloses a conductive ring (fig. 2 (8a) and column 4, lines 39-40) disposed between the metallic diaphragm (fig. 2 (7)) and the circuit board (fig. 2 (13a)). It should also be noted that the pressure port assembly (fig. 2 (9)) is coupled to the conductive ring by the screw (fig. 2 (4)), and a cavity is formed between a pressure port and the metallic diaphragm. Since the circuit board has a through hole (fig. 2 (O1)), the cavity (fig. 2 (5a)) that is formed actually is between the pressure port and the metallic diaphragm, as stated in the above rejection.

12. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching,

suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, motivation is found in Pechoux, as shown in the rejection above, wherein Pechoux uses the conductive ring to connect the circuit board to the metallic diaphragm (column 4, lines 34-37). It should be noted that the portion of Pechoux that the Applicants argue against for providing motivation for combination is different than what was cited in the previous office action.

Allowable Subject Matter

13. Claims 31-59, 61 and 62 are allowed.

Claims 4-10, 15-19 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Final Rejection

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Dole whose telephone number is (571) 272-2229. The examiner can normally be reached on Mon. thru Fri. from 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (571) 272-2233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TJD

ANJAN DEB
PRIMARY EXAMINER